

Claims

[c1]

Apparatus comprising:

a plurality of proximate devices each having:

an inter-device link which provides inter-device communication between each proximate device and said plurality of proximate devices;

a programmable frequency clock; and

a clock frequency controller which operates in a master operating mode and a slave operating mode and which couples said inter-device link and said programmable frequency clock and controls the frequency of said programmable frequency clock by:

(a) detecting a master operating mode and performing one of:

maintaining the current operating frequency as the master operating frequency; and

setting the frequency of said programmable frequency clock to a predetermined master operating frequency; and

(b) detecting a slave operating mode and:

(b1) receiving a frequency modify command indicating a desired operating frequency wherein the frequency modify command is initiated by a proximate device operating in the master operating mode and wherein the frequency modify command is coupled through said inter-device link;

(b2) ascertaining a difference in the desired operating frequency and a current operating frequency; and

(b3) setting the frequency of said programmable frequency clock to the desired operating frequency when the difference is ascertained;.

[c2]

Apparatus of Claim 1 wherein said clock frequency controller of said proximate device operating in the master operating mode further controls the frequency of a proximate device operating in the slave operating mode by:

(c) recognizing the presence of said proximate device operating in the slave mode coupled through said inter-device link;

(d) identifying a unique frequency of operation for said proximate device operating in the slave operating mode; and

(e) transmitting a frequency modify command indicating the unique frequency wherein the frequency modify command is coupled through said inter-device link;

[c3] Apparatus of Claim 2 wherein the identification (d) of the unique frequency is based on a component of the unique frequency wherein the component is selected from the group consisting of: a fundamental component and a harmonic component.

[c4] Apparatus of Claim 1 wherein said predetermined master operating frequency is determined by:

(a1) detecting a master frequency selection mode and:

(a11) selecting a master device operating frequency; and

(a12) negating the master frequency selection mode and setting a master frequency modify mode; and

(a2) detecting the master frequency modify mode and:

(a21) ascertaining a difference between said master device operating frequency and a current operating frequency; and;

(a22) setting the frequency of said programmable frequency clock to said master device operating frequency when the difference is ascertained;.

[c5] Apparatus of Claim 4 wherein said clock frequency controller of said proximate device operating in the master operating mode initiates a change in operating frequency by:

recognizing a master reset command; and

setting the master frequency selection mode.

[c6] Apparatus of Claim 4 wherein the selection (a11) of said master device operating frequency is performed autonomically by:

(a111) selecting a candidate frequency from a plurality of available frequencies;

(a112) confirming the candidate frequency as acceptable; and

(a113) designating the candidate frequency as unavailable and reexecuting the selection of (a111) when the candidate frequency is not

acceptable.

[c7] Apparatus of Claim 6 wherein the plurality of available frequencies differ by an amount equal to or greater than a predetermined frequency differential.

[c8] Apparatus of Claim 6 wherein the confirmation (a112) of the candidate frequency is based on a component of the candidate frequency wherein the component is selected from the group consisting of: a fundamental component and a harmonic component.

[c9] Apparatus of Claim 1 wherein said clock frequency controller of said proximate device operating in the master operating mode resets the frequency of a proximate device operating in the slave operating mode by:

- (f) recognizing a slave reset command;
- (g) identifying a unique frequency of operation for said proximate device operating in the slave operating mode; and
- (h) transmitting a frequency modify command indicating the unique frequency wherein the frequency modify command is coupled through said inter-device link;

[c10] Apparatus of Claim 9 wherein the slave reset command is an external command.

[c11] Apparatus of Claim 1 wherein said clock frequency controller of said proximate device operating in the master operating mode resets the frequency of all proximate devices operating in the slave operating mode and coupled through said inter-device link by:

- (l) recognizing a slave reset all command;
- (j) identifying a unique frequency of operation for each of said proximate devices operating in the slave operating mode; and
- (k) transmitting a frequency modify command to each of said proximate devices operating in the slave operating mode indicating each of the unique frequencies wherein the frequency modify commands are coupled through said inter-device link;

whereby the operating frequencies of said proximate device operating in the

master operating mode and each of the proximate devices operating in the slave operating mode are unique.

[c12] Apparatus of Claim 11 wherein the slave reset all command is an external command.

[c13] Apparatus comprising:

- a master processing system having a processor, a memory, and a master inter-system link;

- a housing;

- a plurality of slave processing systems housed in said housing and each having a processor which executes code stored in a system memory, an inter-system link which provides inter-system communication between each slave processing system and said master processing system via the master inter-system link, a programmable frequency system clock, and a clock frequency controller which couples the inter-system link and the programmable frequency system clock and controls the frequency of the programmable frequency system clock by:

 - receiving a frequency modify command indicating a desired processing system operating frequency wherein the frequency modify command is initiated by said master processing system; and
 - setting the frequency of said programmable frequency system clock to the desired operating frequency;

wherein the master processing system initiates a frequency modify command for each of said slave processing systems whereby each of said slave processing systems operates at a unique operating frequency each unique frequency differing from each other by at least a predetermined frequency differential.

[c14] Apparatus of Claim 13 wherein the programmable frequency clock is a spread frequency spectrum clock and wherein each unique frequency differs from each other by at least the sum of the predetermined frequency differential and at least half of the spread frequency spectrum differential.

[c15] Apparatus of Claim 13 wherein said master processing system further comprises code stored in the memory for execution by the processor and

effective when executing in performing the steps of:

- (a) maintaining a list of available frequencies;
- (b) maintaining a list of unavailable frequencies; and
- (c) selecting for each of said plurality of slave processing systems the unique operating frequency from the list of available frequencies.

[c16] Apparatus of Claim 15 wherein said master processing system further comprises:

- a display; and
- a user input device;
- a user input device;

wherein the code is further effective in performing the steps of:

- (d) displaying on the display a user prompt soliciting input data; and
- (e) accepting the input data through the user input device;

wherein the input data is utilized in a step selected from the group of steps consisting of: the maintaining step (a), the maintaining step (b), and the selecting step (c).

[c17] Apparatus of Claim 16 wherein the fundamental component of a frequency belonging to a list selected from the group of lists consisting of: the list of available frequencies and the list of unavailable frequencies, are utilized in a step selected from the group of steps consisting of: the maintaining step (a), the maintaining step (b), and the selecting step (c).

[c18] Apparatus of Claim 16 wherein a harmonic component of a frequency belonging to a list selected from the group of lists consisting of: the list of available frequencies and the list of unavailable frequencies, are utilized in a step selected from the group of steps consisting of: the maintaining step (a), the maintaining step (b), and the selecting step (c).

[c19] A method comprising:
initiating at a master processing system having a processor, a memory,
and a master inter-system link a plurality of frequency modify commands
each indicating a desired processing system operating frequency;
receiving the frequency modify commands at a plurality of slave

processing systems housed in a housing and each having a processor which executes code stored in a system memory, an inter-system link which provides inter-system communication between each slave processing system and the master processing system via the master inter-system link, a programmable frequency system clock, and a clock frequency controller which couples the inter-system link and the programmable frequency system clock and controls the frequency of the programmable frequency system clock; and
setting the frequency of the programmable frequency system clock to the desired operating frequency;

whereby each of the slave processing systems operates at a unique operating frequency each unique frequency differing from each other by at least a predetermined frequency differential.

[c20] The method of Claim 19 wherein said initiating step further comprises the steps of:

- (a) maintaining a list of available frequencies;
- (b) maintaining a list of unavailable frequencies; and
- (c) selecting for each of the plurality of slave processing systems the unique operating frequency from the list of available frequencies.

[c21] The method of Claim 20 the master processing system further comprises a display and a user input device and wherein said initiating step further comprises the steps of:

- (d) displaying on the display a user prompt soliciting input data; and
- (e) accepting the input data through the user input device;

wherein the input data is utilized in a step selected from the group of steps consisting of: the maintaining step (a), the maintaining step (b), and the selecting step (c).

[c22]

A program product comprising:

- a computer readable medium;
- a computer executable program stored on said computer readable medium, said computer executable program being effective in executing

the steps of:

initiating at a master processing system having a processor, a memory, and a master inter-system link a plurality of frequency modify commands each indicating a desired processing system operating frequency;

receiving the frequency modify commands at a plurality of slave processing systems housed in a housing and each having a processor which executes code stored in a system memory, an inter-system link which provides inter-system communication between each slave processing system and the master processing system via the master inter-system link, a programmable frequency system clock, and a clock frequency controller which couples the inter-system link and the programmable frequency system clock and controls the frequency of the programmable frequency system clock; and

setting the frequency of the programmable frequency system clock to the desired operating frequency;

whereby each of the slave processing systems operates at a unique operating frequency each unique frequency differing from each other by at least a predetermined frequency differential.

[c23]

The product of Claim 22 wherein said initiating step further comprises the steps of:

- (a) maintaining a list of available frequencies;
- (b) maintaining a list of unavailable frequencies; and
- (c) selecting for each of the plurality of slave processing systems the unique operating frequency from the list of available frequencies.

[c24]

The product of Claim 23 wherein the master processing system further comprises a display and a user input device and wherein said initiating step further comprises the steps of:

- (d) displaying on the display a user prompt soliciting input data; and
- (e) accepting the input data through the user input device;

wherein the input data is utilized in a step selected from the group of steps

consisting of: the maintaining step (a), the maintaining step (b), and the selecting step (c).

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